
THE PENSION SYSTEM FOR FARMERS IN ROMANIA FACTS AND PERSPECTIVES

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Abstract

The implementation of performance-based budgeting as a fiscal policy goal involves, among others, raising predictability in terms of the size and spending manner of public financial resources, including farmers' pensions. At the same time, social responsibility requires the government to pay more attention to the impact of operations undertaken economically, socially and environmentally. Amid these premises, this paper approaches the following: setting coordinates for the current pension system for farmers, highlighting the role of the government in managing and financing this system, assessing its viability by using a linear statistical model and extrapolations.

Keywords: pension, farmers, statistical modeling

JEL codes: G23, J26

1. Introduction

Favoring economic progress is found among the objectives of the financial policy of every country through economic social relations established during the process of forming and using public financial resources, which the government needs in order to exercise its rights and obligations towards the nation. Among the multitude of factors upon which this objective depends, we will refer to social protection for farmers – the elderly.

Thus, the public pension system, which is facing unprecedented challenges, includes farmers in the specter of its beneficiaries (the members of former agricultural production cooperatives and the farmers in agricultural areas that were not included in a production cooperative, and, since 1992, the forest landowners and farmers, as well as their family members aged over 15, who performed unwaged work in their farms or in associative forms of agriculture).

2. The specific of farmers' pensions

Among the elements of individualization for farmers' pensions, we can identify at least the following:

- The late inclusion in the social insurance system: only in 1977, regulated by Law no. 4 regarding pensions and other social insurance rights for members of agricultural production cooperatives and Law no. 5 regarding pensions and other social insurance rights for farmers with individual farms in areas that were not included in a production cooperative;

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- The existence (before the reforming process) of discriminating conditions in granting pensions, both in terms of the retirement age and in terms of the calculus of seniority (based on number of norms and not on years of employment);

- Method of financing: universal, non-contributory, funded by the state budget (starting with 2005). Non-contributory financing refers to the system's inputs, namely the extremely low share (approximately 2.5%) of active farmers that contribute to the social insurance system to supply with money the pensions of inactive farmers. In this case, we are dealing with an intergenerational transfer of financial resources, as well as a generational transfer due to the fact that retirees contribute through various taxes.

- The pension's quantum: much lower than for other social groups. In the last five years it accounted for approximately 40% of the pension's quantum for social insurance pensions. By funding farmers' pensions from the state budget, a pension that initially belonged to the social insurance system has been practically transformed into social welfare, a guaranteed minimum income.

- Population ageing (according to Eurostat, the proportion of the population aged over 60 was 29.1% in 2010, and the estimations for 2050 increase this percentage by 5.7 percentage points) and, additionally, a population decrease (for the age group 0 to 19, from 21.8% in 2010 to 18.9% in 2050) are contemporary phenomena, which impact the size of the pension system, including the social benefits for farmers Stegaroiu (2009, p. 47).

Paradoxically, the population ageing phenomenon, which is prominent in Europe, doesn't affect this social category. Why? Because we are referring to a population segment for which the inputs were "suspended" in 1992, when agricultural production cooperatives were eliminated. As for the farmers who worked in agricultural areas that were not included in a production cooperative, they have the lowest pensions. They had to contribute with money each month in order to receive and continue to have the right to a pension. Unfortunately, for most of them, "nothing was ever paid and they have no pensions" Dobrescu (2010, p. 26).

3. The viability analysis for the current pension system for farmers

3.1. Premises

Given the aging population and the decline of the active work force, each country must implement specific reforms, tailored to the social aspects that must be taken into account Dragota and Miricescu (2010, p. 101).

In terms of life expectancy in Romania (68.7 years for men and 75.7 for women, according to a prognosis for 2020 - Seitan (2008) and of the percentage of retirees who achieved full contribution (48.67% - www.mmuncii.ro), the objectives of the model developed recently by Martin (2010), namely increasing the default retirement age (up to 67 years old) and extending the average period of contribution to the public pension system from 15 to 40 years in order to cover most of the individual's life cycle, don't seem to fit to the structure of the pension system in our country, at least not in the coming years, and especially not when farmers are concerned. The

growing reluctance of current active persons shouldn't be neglected, nor should the principle of equity, which concerns equal rights between present and future generations.

At the same time, the state has the responsibility to identify the financial means that will determine the mobilization of financial resources, the accounting of all the influence factors, including the fact that for a certain period of time (until 2025) the burden of covering “the social allowance for farmers” will diminish.

In the last 10 years, the financial effort of the government for farmers' pensions has been based on two indicators: the quantum of the average monthly pension for farmers and the number of retired farmers. Their evolution over the past 10 years is shown in the following table:

Table 1. The quantum of the average monthly pension for farmers and the number of retired farmers – between 2001 and 2010

Year Indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average monthly pension for farmers (lei)	27	34	39	74	88	117	159	253	300	308.8*
Number of retired farmers (thousand persons)	1766.6	1677	1571	1476.3	1291.7	1005.3	931.9	866.1	799.2	741.8*

* The date refer to the first ten months of 2010;

Source: <http://www.mmuncii.ro/ro/55-view.html>

The presented data reveal the growing evolution of the farmers' pension quantum of approximately 11.43 times in 10 years as a result of increasing the score for each year of the useful time taken into account at the calculus of the pension, as well as the indexation of pension point value. At the same time, the downward evolution of the number of retired farmers is also obvious, from 1766.6 thousand people in 2001 to 741.8 thousand people ten years later.

Therefore, this structure of the pension system that is financed from the state budget is going to “disappear”, which implicitly means relieving the state of the burden of ensuring financial resources for former retired farmers. Although, the expenditure with farmers' pensions represents a small percentage of total expenses covered by the state budget, given the premise that one must know how to persevere in order to achieve balance (Confucius) and the need to active the role of forecasts in identifying the reforming strategies for social policies, we wish to estimate the moment when the government will stop allotting financial resources for “former” farmers (according to Law no. 263/2008, since 2011 the concept of farmer was redefined according to the realities of economy: people aged between 16 and 63, who

live temporarily or permanently in rural areas, as well as family members who own, under any title, agricultural or forest lands, fisheries, livestock and beehives; people who perform agricultural activities in their own household, as well as unwaged work in agriculture, forestry, animal husbandry, pisciculture, apiculture, sericulture and so on).

3.2. Statistical modeling

Next, we wish to determine the number of retirees for the coming years in order to identify a basis for the measurement of the government's effort to support farmers' pensions (we will use the data in the studied sample – 2001-2010).

We assume that the number of retirees varies linearly in relation to time. According to the data regarding the evolution of the number of agricultural retirees seen above, we intend to determine a function that highlights this aspect and to determine the representative ness of the model.

The number of retirees in relation to time can be expressed by cumulating the trend and the deviations from this trend:

$$Y(t) = T(t) + \varepsilon \quad (1)$$

$$T(t) = a + b \cdot t \quad (2)$$

Of the trend comes from the system of equations:

$$\begin{cases} M(y(t)) = a + b \cdot M(t) \\ M(t \cdot y(t)) = a \cdot M(t) + b \cdot M(t^2) \end{cases} \quad (3)$$

With:

$$M(t) = \frac{1 + 2 + \dots + 10}{10} = 5.5$$

$$M(y(t)) = \frac{1766.6 + 1677 + 1571 + 1473.3 + \dots + 741.8}{10} = 1212.69$$

$$M(t^2) = \frac{1^2 + 2^2 + \dots + 10^2}{10} = 38.5$$

$$M(t \cdot y(t)) = \frac{1 \cdot 1766.6 + 2 \cdot 1677.2 + 3 \cdot 1571 + \dots + 10 \cdot 741.8}{10} = 5629.2$$

After substitution, we obtain:

$$\begin{cases} a + 5,5*b = 1212.69 \\ 5.5a + 38.5*b = 5629.11 \end{cases} \quad (4)$$

$$\Rightarrow \begin{cases} b = - 126.13 \\ a = 1906.41 \end{cases}$$

The mathematic formula:

$$T(t) = 1906.41 - 126.13* t \quad (5)$$

The following table is drawn up to check the consistency of the model with reality; the table includes deviations from the trend:

Table2. Deviations from the trend

	2001	2001	2003	2004	2005	2006	2007	2008	2009	2010
t	1	2	3	4	5	6	7	8	9	10
y(t)	1766.60	1677.00	1571.00	1473.30	1291.70	1005.30	931.90	866.10	799.20	741.80
T(t)	1780.28	1654.15	1528.02	1401.89	1275.76	1149.63	1023.50	897.37	771.24	645.11
$\varepsilon(t)$	-13.68	22.85	42.98	74.41	15.94	-144.33	-91.60	-31.27	27.96	96.69

Where:

$$\varepsilon(t) = y(t) - T(t) \quad (6)$$

The statistical test is based on random variables: $F = \frac{R_{01}^2 (n - 2)}{1 - R_{01}^2} \quad (7)$

Based on a risk $\alpha \leq 5$ of the Fischer Table with the degrees of freedom $\nu_1 = 1$ and $\nu_2 = n - 2 = 8$, it results that the distribution $F_{\nu_1, \nu_2} = 5,32$ and the acceptance of linearity in the distribution [0; 5.32]. A particular F value is calculated on the basis of the sample data (n = 10).

$$F_{calc} = \frac{\hat{R}_{01}^2 (n - 2)}{1 - \hat{R}_{01}^2} \quad (8)$$

$$\hat{R}_{01} = \sqrt{1 - \frac{\det M}{m_{00} - m_{11}}} \quad (9)$$

Where:

$$M = \begin{pmatrix} m_{00} & m_{01} \\ m_{10} & m_{11} \end{pmatrix} \quad (10)$$

And:

$$m_{00} = \sigma_Y^2 = \frac{(1766.6-1212.69)^2 + (1677-1212.69)^2 + \dots + (741.89-1212.69)^2}{10} = 136120.86$$

$$m_{11} = \sigma_t^2 = \frac{(1-5.5)^2 + (2-5.5)^2 + \dots + (10-5.5)^2}{10} = 8.25$$

$$m_{10} = M_{01} = M((t*y(t)) - M(t)*M(y(t))) = 5.629.2 - 5.5*12124.69 = - 1040.59$$

So,

$$\det M = 136120.86*6.67 - 1040.59^2 = 40169.55$$

$$\hat{R}_{01} = \sqrt{1 - \frac{40169.25}{136120.86*8.25}} = 0.982 \quad (11)$$

$$F_{\text{calc}} = \frac{0.964(10-2)}{1-0.964} = 214.22 \notin [0;5.32] \quad (12)$$

Because F_{calc} doesn't belong to the distribution $[0; 5.32]$, we can conclude that $Y(t) = 1906.41 - 126.13*t$ explains quite well the evolution of the number of agricultural retirees in relation with time at the level of the global population, for a materiality value of 5%.

Next, we want to make a forecast based on the determined linear model for the year 2012 by considering a materiality value of 5%. Thus, we will use the formula:

$$P(\hat{Y}_{n+h} - t_{\frac{\alpha}{2}, n-2} * \sqrt{\hat{V}} \leq Y_{n+h} \leq \hat{Y}_{n+h} + t_{\frac{\alpha}{2}, n-2} * \sqrt{\hat{V}}) = 1 - \alpha \quad (13)$$

Where y_{n+h} is the precise forecast based on the model for the used sample $t_{\frac{\alpha}{2}, n-2}$ is the chart value from the Fisher Table, corresponding to $n-2$ degrees of freedom and a probability of $\alpha/2$, and the variation is given by relation:

$$\hat{V} = \hat{S}^2 \left[1 + \frac{1}{n} + \frac{(t_{n+h} - \hat{t})^2}{\sum_{i=1}^5 (t_i - \hat{t})^2} \right] \quad (14)$$

$$\hat{S}^2 = \frac{\sum_{i=1}^5 \varepsilon_i^2}{n-2} = \frac{(-13.68)^2 + 22.85^2 + \dots + 96.69^2}{10-2} = 6084.71 \quad (15)$$

And:

$$\hat{V} = 6084.71 \left[1 + \frac{1}{10} + \frac{(13-5.5)^2}{(1-5.5)^2 + (2-5.5)^2 + \dots + (10-5.5)^2} \right] = 10.557.549$$

$$\sqrt{\hat{V}} = 102.75$$

$$\alpha / 2 = 0.025 \Rightarrow t_{\frac{\alpha}{2}, n-2} = 2.896$$

$$n - 2 = 8$$

For 2012 we have:

$$\hat{V} = 9809.29; \sqrt{\hat{V}} = 99.04; Y(12) = 1935.08 - 134.08 * 12 = 392.85$$

So, result:

$$P(392.85 - 2.896 * 102.75 \leq Y_{13} < 392.85 + 2.896 * 102.75) = 95\%$$

$$P(106.03 \leq Y_{12} \leq 679.67) = 95\%$$

So, in 2012, the number of retirees will be between 106.03 and 679.67 thousands persons, with a probability of 95%.

According to the calculus it results that the linear model is representative for the given situation. Further extrapolations were made for the years 2012 – 2019:

Table 3. The estimated number of retirees with a probability of 95% for the period between 2013 and 2019

Year	Estimated number of retirees - 95% probability
2013	$P(-34.81 \leq Y3 \leq 568.25) = 95\%$
2014	$P(-179.56 \leq Y14 \leq 460.74) = 95\%$
2015	$P(-179.56 \leq Y15 \leq 460.74) = 95\%$
2016	$P(-464.29 \leq Y16 \leq 240.95) = 95\%$
2017	$P(-609.21 \leq Y17 \leq 133.61) = 95\%$
2018	$P(-754.8 \leq Y18 \leq 26.94) = 95\%$
2019	$P(-901 \leq Y19 \leq -79.12) = 95\%$

It is possible that in 2017 this category of pensioners will no longer exist, and, at the same time, it's possible that the state will cover pensions for a number of 133.61 thousand retirees ($P(-609,21 \leq Y17 \leq 133,61) \leq 95$).

However, we may say with certainty that the government will be relieved of the burden of ensuring financial resources for former retired farmers in 2019.

4. Conclusions

The government must always be prepared to notice changes in the surrounding systems and to analyze the consequences. From a socio-cultural perspective, we are witnessing changes in the demographic structure, in the value system of people, in the relationships of different social interest groups.

The aspects presented in this paper allow us to formulate at least the following conclusions:

- the late introduction of farmers in the social insurance pension scheme;
- the quantum of farmers' pensions could be considered as being at the other end of special pensions due to their extremely low level, a little over 300 lei, while other categories of pensions were 100 times higher;
- currently, Romania is combining public budget funding, non-contributory financing (farmers' pensions, occupational pensions) and funding through social insurance (contributory financing);
- Even if the population's decline hasn't had important economic consequences yet, the long-term consequences may lead to imbalances for the entire future demographic evolution. Improving birth rates can't prevent the decline and aging of the active population until 2025, but the most serious consequence is the growing economic burden over the declining active population.
- the statistical approach of the current component of the public pension system for agricultural workers highlights that by 2019 it will no longer have beneficiaries, which will diminish the financial burden placed on the state budget and will force the introduction of a different pension scheme for the "new" farmers. For them, with a few exceptions, the government will pay benefits only in 2025;
- in terms of the "categories of beneficiaries" criterion, we may say that the lifespan of the pension system for farmers created in 1977 will be 42 years. The transformations endured by agriculture in recent years call for the principle of complementarity's, meaning the current categories of retirees will be replaced by others, adequate to the new economic conditions.

The efficient operation of budget programming will require a longer period of time to show benefits because it involves efforts to improve the analysis, management and implementation capacities. Of course, in addition to farmers' pensions there are many other variables that must be analyzed when using certain tactics to materialize social objectives or when preparing strategies meant to generate long-term financial sustainability.

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